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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,427	02/11/2004	George M. Whitesides	H0498.70079US01/TJO	4054
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Timothy J. Oyer, Ph.D. Wolf, Greenfield & Sacks, P.C. 600 Atlantic Avenue Boston, MA 02210				
EXAMINER				
DICUS, TAMRA				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/776,427

**Applicant(s)**

WHITESIDES ET AL.

**Examiner**

TAMRA L. DICUS

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**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-15, 55-59 and 69-75 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-15, 55-59 and 69-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The RCE is acknowledged.

Applicant's arguments filed 05-19-08 have been fully considered but are not found persuasive.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-15, 55-59, and 69 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 5,079,600 to Schnur et al.

Schnur teaches a patterned monomolecular assembly having a nonplanar substrate such as a palladium coated on the surface of a silicon wafer (article) that exhibits excellent step coverage important in fabrication of

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the wafer used in semiconductor microlithography (Example 23, Abstract, Example 25), and a metal coating such as copper and palladium may be on the substrate (8:2-9, 8:46- e.g. "the first layer can be one type of metal such as palladium"). Schnur also teaches a second species - functional group terminating at an end away (the star and triangle shapes illustrated on the nonpolar tails in Figs. 1A and 1B-see col. 9, lines 10-38) and another first molecular species silane molecule selected to bind the surface of the substrate (smallest circle touching the substrate surface) in a terminal end in a monomolecular self-assembling film being chemisorbed in the same way as Applicant (see Example 1, further to hydrophobic and hydrophilic functions, and 10:50-68). Schnur teaches microlithography (embraces all sizes less than 1 micron, overlapping Applicant's ranges) patterns are used explaining the pattern line widths having less than one micron (equivalent to lateral dimension) is suitable for microcircuit lithography (col. 1, lines 60-68, col. 5, lines 15-45, col. 6, lines 45-68, col. 8, lines 1-68, col. 9, lines 10-68, col. 10, lines 1-4, lines 40-65, col. 11, lines 1-25, FIGS. 1A-3B , 5B and associated text) suitable for patterning (instant claims 3-15, 55-59, and 69 are met).

Claims 70-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,079,600 to Schnur et al. in view of USPN 4,728,591 to Clark et al.

Schnur essentially teaches the claimed invention as applied to claim 69 above.

Schnur does not teach a patterning having the surrounded regions as recited (instant claims 70-75).

However, Schnur teaches microlithography patterns can be used from the background explaining the patterns having less than one micron is suitable for microcircuit lithography (cited above). Thus, because the cited claimed ranges are less than one micron, they fall within the prior art range.

Further, Clark explicitly teaches the required ranges are suitable in microlithography patterns. Clark teaches a device comprising: an article defining a surface (col. 2, line 32, e.g. substrate surface); and an isolated region of a self-assembled monolayer of a first molecular species having a function (col. 2, lines 49-55, e.g. a functional material deposited through holes such as a protein and enzymes molecules) surrounded by a second molecular species on the surface and terminating in the same way (e.g. at the ends of the pattern as per Applicant's specification-see [0053-0059]) (col. 2, lines 40-49, FIG. 2 and associated text, . two-dimensional self-assembled molecular array of protein and enzymes molecules). The isolated region in lateral dimension and area (encompassed by characteristic dimension) is between 1-50 nm (.01-.5 microns), meeting Applicant's range of less than about 10 microns, 5 microns, 1 micron, and 0.25 microns, less than 100 sq. microns, less than 25 microns, less than 1 sq. microns, and less than 0.06 microns, as the first material is surround by the pattern via the second molecular species, see col. 3, lines 56-59 and col. 4, lines 40-45. The terminations of the second molecular species

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and the first being on and exposed away from the surface are defined by the pattern as shown in FIG. 2 and associated text, see where 20 is bound to 12, thus bind to surface 10 (col. 13, line 60-col. 14, lines 1-40, col. 14, lines 50-col. 15, line 30, cationic polylysine serve to bind to anionic ferritin). See also patented claims, Abstract, and col. 8, lines 1-5.

Thus, it would have been obvious to one having ordinary skill in the art to have modified Schnur because Schnur suggests microlithography patterns may be applied to the wafer and Clark teaches the wafer having the required microlithography patterns in nanoscale to produce complexes structures as cited above.

### ***Response to Arguments***

Applicant's arguments filed 11/25/08 have been fully considered but they are not persuasive.

Applicant argues palladium is washed away, however, col. 8 explicitly teaches a metal coating of palladium bound to the substrate, and while a pattern coating of areas where a non metal area is on the substrate, there are portions where metal is on it and palladium is taught in addition to being an equivalent to copper –see Schnur, Abstract, 8:46 and Example 4 (metal copper patterns on silicon wafer). Thus it is not convincing that a metal of palladium is not on the substrate.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAMRA L. DICUS whose telephone number is (571)272-1519. The examiner can normally be reached on Monday-Friday, 7:00-4:30 p.m., alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The

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fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tamra L. Dicus /TLD/  
Examiner  
Art Unit 1794

March 2, 2009

/Bruce H Hess/  
Primary Examiner, Art Unit 1794